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An Account

Of the Invention of Grinding Optick and Burning-Glasses, of a Figure not-Spherical, produced before the Royal Society.

The ingenious and industrious *Francis Smethwick Esquire*, Fellow of the *Royal Society*, having for divers years painfully search'd after the way of grinding Glasses *not-Spherical*, affirms, that at length he hath now found it; for the proof of which, he lately (viz. February 27. 1668.) produced before the said Society certain *Specimina* of that Invention, which were a *Telescope*, a *Reading* and two *Burning-Glasses*.

The *Telescope* was about four foot long, furnish'd with four Glasses, whereof the three *Ocular* ones, *Plano-convex*, were of this newly-invented *not-Spherical* Figure, and the fourth a *spherical* Object-glass. This being compared with a common, yet very good *Telescope*, longer than it by about four inches, and turned to several Objects, was found by those of the said Society that look'd through them both, to exceed the other in goodness, by taking in a greater Angle, and representing the Objects more exactly in their respective proportions, and enduring a greater Aperture, free from Colours.

The *Reading Glass* of the same Figure being compared with a common *Spherical-Glass*, did far excell it, by magnifying the Letters, to which it was applied, up to the very edges, and by shewing them distinctly from one brim through the Center to the other, which the *Spherical Glass* came far short of. And this effect the new-figur'd Glass perform'd only on one of its sides, and not on the other, as being of a different figure from *Spherical-Glasses*, which perform their effect near equally on both sides.

Lastly, The two *Burning-Concaves* of this new-invented figures were, the one of six inches Diameter, its *focus* three iaches distant from the Center thereof; the other of the same Diameter, but less concave, and its *focus* 10 inches distant. These, when approach'd to a large Candle lighted, did somewhat warm the faces of those, that were 4 or 5 foot distant at least, and when

held to the fire, burned Gloves and Garments at the distance of about three foot from the Fire.

Which were the particulars, the *R. Society* observed in these Glasses, and gave order to be Registered in their Books; encouraging the *Inventor* to proceed in this Work with all possible care and diligence, for enabling himself to instruct others in the way of Grinding these *Glasses* with facility.

The *Inventor* having declared his resolution to do so, added these Particulars. *First*, That the Lord Bishop of *Salisbury*, *Seth Ward* (who was then absent from the Meeting of the *society*) had been by, when the *deeper* of his two Concaves turned a piece of Wood into flame in the space of *ten* seconds of time;

* This the said judicious Prelate at another Meeting of the Royal Society, attested to be true.

and the *shallower*, in *five* seconds at most, in the season of *Autumn*, about *9* of the Clock in the Morning, the Weather gloomy*. *Secondly*, That the deeper Concave,

when held to a lucid Body, would cast a Light strong enough to read by at a considerable distance. *Thirdly*, That exposing the same to a Northern Window, on which the Sun shined not at all, or very little, he had perceived, that it would warm ones hand sensibly, by collecting the warm'd Air in the day-time, which it would not do after Sun-set.

An Account

Of some Observations made by Mr. Samuel Colepreffe at and nigh Plimouth, An. 1667. by way of Answer to some of the Quæries concerning Tides, propos'd Numb. 17. and 18.

1. **O**ur Diurnal Tides, from about the latter end of *March* till the latter end of *September*, are about a foot higher (*perpendicular*, which is always to be understood) in the *Evening* than in the *Morning*, that is, in every Tide that happens after *12* in the day before *12* at night.

2. On the contrary, the *Morning* Tides from *Michaelmas* 'till our *Lady-day* in *March* again, are constantly higher by about a foot than those that happen in the *Evening*. And this proportion holds in *both*, after the gradual increase of the Tides rising